

GrandForks_transcript

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1 UNITED STATES DEPARTMENT OF ENERGY (DOE)
2 OFFICE OF FOSSIL ENERGY
3 CARBON SEQUESTRATION PROGRAM
4 PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT
5 PUBLIC SCOPING MEETING
6
7

8 -----
9 TRANSCRIPT OF PROCEEDINGS
10 JUNE 10, 2004
11
12
13

14 SPEAKERS:
15
16 HEINO BECKERT, DOE/NETC
17 SARAH FORBES, DOE/NETC
18 EDWARD STEADMAN, EERC
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SPEAKERS:	PAGE NO.
HEINO BECKERT	4
SARAH FORBES	20
EDWARD Steadman	40

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1 The following is the Transcript of
2 Proceedings in the above-entitled cause taken
3 before Joyce A. Halverson, Court Reporter and
4 Notary Public within and for the State of
5 North Dakota, at 2022 Central Boulevard, N. E. ,

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6 East Grand Forks, Minnesota 45721 on Thursday,
7 June 10th, 2004, at 7:02 p.m., to-wit:
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1 MR. BECKERT: Good evening, Ladies
2 and Gentlemen. For the record, I will be
3 reading a prepared statement. The time
4 is now two minutes after 7 p.m. so let us
5 begin.

6 This meeting is governed under the
7 National Environmental Policy Act and was
8 arranged by the U.S. Department of

9 Energy.
10 It's one part of a process to obtain
11 public participation for preparing a
12 detailed environmental review term, an
13 environmental impact statement that will
14 assist the Department of Energy in
15 identifying and prioritizing issues,
16 evaluating potential impacts,
17 establishing the framework for
18 environmental solutions and defining a
19 program for future research development
20 and testing of technologies and methods
21 for the sequestration of carbon dioxide.
22 This is the last of eight meetings
23 at various locations around the country
24 for that purpose. The carbon
25 sequestration activity supported by the

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1 Department of Energy would help achieve
2 the goals of the Global Climate
3 Initiative announced by the president.
4 That initiative will require both
5 development of a portfolio of technology
6 options with the potential to reduce the
7 carbon intensity of the issues of economy
8 and establishment of the information base
9 needed by the year 2012 for effective
10 carbon sequestration decisions that
11 balance economic growth and investment in
12 clean energy technologies.

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13 The implementation of a carbon
14 sequestration program to achieve those
15 goals provides the essence of the basis
16 for the Department of Energy's decision
17 to prepare an environmental impact
18 statement. Your input and comments will
19 be an important part of this effort so we
20 want to thank you for your attendance.

21 My name is Heino Beckert and I am an
22 employee from the Department of Energy
23 laboratory near Morgantown, West
24 Virginia.

25 We have one other representative

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6

1 from the Department of Energy here this
2 evening and she will introduce herself.

3 MS. FORBES: My name is Sarah Forbes
4 and I am also from our laboratory in
5 Morgantown, West Virginia.

6 MR. BECKERT: Assisting with the
7 preparation of the environmental impact
8 statement and with the logistics of these
9 meetings is a team of environmental and
10 administrative specialists led by
11 Potomac-Hudson Engineering Company, who I
12 will ask the representative from the
13 Potomac-Hudson team who is here tonight
14 to introduce himself.

15 MR. GRIESHABER: Joe Grieshaber,

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Potomac-Hudson Engineering.

17 MR. BECKERT: Thank you. We also
18 have a court reporter here to prepare a
19 transcript of this meeting, particularly
20 of your comments, which we will use to
21 document and identify the views from the
22 public regarding the scope and content of
23 the environmental analyses.

24 At the entrance to the meeting room
25 we provided information regarding

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1 tonight's meeting, including descriptions
2 of the processes to prepare an
3 environmental impact statement and the
4 Department of Energy's current activities
5 and plans related to studies of carbon
6 sequestration.

7 We also have provided a registration
8 sheet so I want to encourage you to sign
9 the form as a record of your attendance.

10 And finally we have provided comment
11 sheets that you can use tonight following
12 the meeting to submit written comments,
13 but tonight we want oral comments in an
14 effort to prepare an environmental
15 analyses of the Carbon Sequestration
16 Program. We will use those comments, as
17 well as any other comments received by
18 the cutoff date of June 25th, to assist
19 us in preparing the environmental impact

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20 statement.

21 A draft of the environmental impact
22 statement, when completed, will be made
23 public for review and comment. That is
24 my prepared statement.

25 And now I would like to give you a

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1 very brief overview of NEPA, the National
2 Environmental Policy Act in general and
3 the Programmatic Impact Statement in
4 particular.

5 NEPA is the National Environmental
6 Policy Act. It became a federal law in
7 1970 and it applies to all federal
8 agencies and the projects that they
9 undertake. It requires that
10 environmental information be made
11 available to public officials before
12 decisions are made and before actions are
13 taken.

14 NEPA then is the cornerstone of
15 environmental review for federal actions
16 and federal programs and projects. This
17 is what NEPA is trying to achieve:
18 better environmental planning and better
19 decisions by federal officials that
20 result from consideration of high quality
21 information, accurate scientific
22 analysis, expert agency comments and

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23 public scrutiny and public input.
24 NEPA ensures that the public is
25 involved in the decision making process

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1 regarding federal projects. Public
2 scoping ensures that the NEPA review
3 focuses on issues and potential impacts
4 that are considered significant by
5 government, by organizations and by the
6 general public. So the EIS must focus on
7 truly significant issues.

8 What triggers a NEPA review? Any
9 major federal action, federal program,
10 federal project that has a potential to
11 significantly affect the human and
12 natural environment requires a review
13 under NEPA.

14 Through the Carbon Sequestration
15 Program, DOE is directly providing
16 resources and funding for the
17 demonstration of technologies to capture
18 and store carbon and to reduce greenhouse
19 gas emissions. See here. Any funding
20 whole or in part by a federal agency will
21 trigger a NEPA review.

22 What then is the proposed federal
23 action that we are talking about
24 tonight? It is, quite simply, the
25 implementation of the DOE's Carbon

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1 Sequestration Program.

2 The Department of Energy -- and I am
3 reading and you can read it as well as I
4 can but that is the basis of what we are
5 doing. The Department of Energy proposes
6 to develop a portfolio of technology
7 options with the potential for achieving
8 goals of the Global Climate Change
9 Initiative, including carbon intensity
10 reduction and readiness for the 2012
11 progress review, through continued
12 implementation of the Carbon
13 Sequestration Program.

14 And Sarah Forbes will tell you in a
15 little bit what this deadline of 2012
16 means in the context of our efforts in
17 the Carbon Sequestration Program.

18 The technology options that we are
19 including under the program are carbon
20 capture and carbon storage and
21 measurement, monitoring and verification
22 and Sarah will also talk more about
23 that.

24 Under the proposed action, DOE would
25 implement efforts as planned under the

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1 regional partnerships, continue to
2 support R&D efforts for respective
3 technologies for capture, storage,
4 monitoring, verification of carbon and
5 fund commercial scale demonstration
6 projects which in their own rights would
7 be subject to their own environmental
8 review.

9 Here we are talking about a
10 programmatic approach or programmatic
11 impact statement. Eventually this will
12 lead to site specific projects which then
13 in their own rights, as I said, will have
14 to undergo their NEPA review.

15 Since this activity is funded by
16 DOE, it must comply with NEPA. As I said
17 before, major federal actions require
18 NEPA compliance. And the nationwide
19 technology driven scope of the carbon
20 sequestration activities certainly
21 warrants a programmatic EIS. This is
22 truly a major federal activity.

23 Then what is the environmental
24 impact statement? To those of you who
25 are intimately familiar with an EIS, I

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1 apologize for having to touch on it but I
2 would like to go over a few major
3 points. It's a public document prepared
4 by a federal agency to help officials

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5 plan actions and make decisions.

6 An EIS is a very structured and
7 formal document, actually. The contents
8 must include the following: You can read
9 those. I don't have to go over that but
10 there are certain requirements in their
11 contents that an EIS must live up to.

12 An EIS is the highest level of
13 review and the most formal environmental
14 documentation under NEPA and there are
15 also environmental assessments and
16 category exclusion documents which would
17 come into play if the project is not very
18 elaborate or if the expected
19 environmental consequences are very
20 minor. So you wouldn't use an EIS for
21 that. An EIS is a very formal and very
22 complex and also a very expensive
23 document.

24 A programmatic EIS, by its name and
25 by virtue of the concept of the program,

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1 it addresses programmatic issues. It is
2 not site specific. It has regional or
3 national scopes. It does not deal, for
4 instance, with a siting or the building
5 of a power plant at a river somewhere.
6 It has a national scope and in our case
7 with the Carbon Sequestration Program.

8 It touches practically all areas of the
9 country.

10 An EIS, including a programmatic
11 EIS, has to state the program of the
12 project that is to be undertaken and it
13 must provide alternatives that must be
14 considered as detailed as the proposed
15 action.

16 For our programmatic EIS, we
17 envision the no action alternative. That
18 means that the program would be limited
19 at the current R&D level. We might
20 modify the schedule for implementation of
21 various components. We have perhaps
22 variations in the technologies that might
23 be demonstrated and we have certainly
24 variations in implementation by the
25 geographic regions. And we would

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1 eliminate flawed technologies as they are
2 being identified as such.

3 Typically, in an EIS we would
4 consider these subjects here: Usually we
5 deal with air quality, water quality,
6 land use, solid waste and waste
7 management, transportation, socioeconomic
8 and environmental justice, certain
9 endangered species, absolutely, historic
10 and cultural resources. Wherever there
11 are such concerns, when these concerns

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12 surface, they will certainly be
13 addressed.

14 As identified during the scoping
15 process and exemplified by this meeting
16 tonight, issues and impacts that have the
17 highest potential for significance or
18 have the highest significance for
19 environmental affects or impact will be
20 identified to receive the greatest
21 scrutiny of the EIS. Obviously, the more
22 important the subject, the more near and
23 dear it is to the local folks, the more
24 detail it will be treated with.

25 The purpose of this meeting is to

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1 invite comments from all interested
2 persons. You should be aware of the fact
3 that your comments and concerns are
4 important to us. All comments will be
5 considered. And since we are in the
6 early stage of planning this
7 environmental analysis, now is the best
8 time to have your comments at this
9 juncture.

10 The public scoping meeting then is
11 your opportunity to comment on the carbon
12 sequestration program as a whole or any
13 aspect thereof, to identify issues and
14 potential impact that you consider

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15 significant. This will help steer the
16 program and it will contribute to the
17 decision making process.

18 In order to elicit comments on a
19 nation-wide scale, meetings like this
20 have been conducted all over the country,
21 in Washington, D. C., Columbus, Ohio,
22 Chicago, Houston, Sacramento, Atlanta,
23 two days ago in Bozeman, Montana and
24 tonight in Grand Forks, North Dakota.

25 A word about the meeting logistics.

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1 The balance of the meeting will be
2 conducted, as indicated, on the slide.
3 After I finish discussing the NEPA
4 process, I will introduce Sarah Forbes
5 and ask her to present the key features
6 of the Carbon Sequestration Program and
7 then the floor will be open for
8 individuals wishing to comment on the
9 proposed action.

10 We will hear speakers in the order
11 that they have signed up to speak. There
12 is no time limit tonight on how long you
13 want to speak. Normally, if we have a
14 packed house, we allow five minutes per
15 speaker. Tonight you're welcome to speak
16 as long as 10 minutes, if you like. No
17 problem.

18 Speakers are requested to state

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19 their name clearly and spell it out for
20 the record. Also please indicate your
21 affiliation with any organization, if
22 that is appropriate.

23 Although we have a court reporter
24 present to prepare a written transcript,
25 we encourage you to submit your comments

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1 in writing as well. This gives us a
2 better handle on things and we can keep
3 better track of who said what, for what
4 purpose. And since all this will be a
5 part of the EIS, we would like to have as
6 much information as possible.

7 In brief, this is the EIS process,
8 public scoping meeting, public scoping
9 period begins here, we are now here, and
10 implementation plan, I don't think we'll
11 do one. We will come up with a draft EIS
12 in the summer of 2005, roughly a year
13 from now.

14 After the draft has been published
15 or as it's being published, we make a
16 public comment period, have one for 120
17 days. During this comment period, we
18 have public hearings at the same
19 locations, the same town, not in the same
20 building but certainly in the same area
21 where we had those scoping meetings.

22 Based on the comments that we have
23 received on the draft, we will prepare
24 the final EIS. And after the final EIS
25 has been prepared and published, we will

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1 publish a record of decision, which is a
2 formal statement that this is the
3 proposed action, these, in a nutshell,
4 are the concerns and here's what we are
5 going to do about it.

6 The final EIS is expected to be
7 issued in the spring of 2006.
8 Information about the programmatic EIS
9 will be made available in the federal
10 register. DOE points of contact, that is
11 me, DOE's Carbon Sequestration web site
12 and the Carbon Sequestration news
13 letters.

14 These E-mail addresses are in your
15 handout package. I urge you to check the
16 carbon sequestration web site. New
17 things, as they come up, will be
18 published there and the interviews give
19 you a wealth of information in general
20 and in particular if you want to look for
21 a certain topic that interests you.

22 If you want to contact me or get in
23 any way ahold of me or if for any kind of
24 comments, questions, anything, I'm the
25 contact person. This is my address

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1 here. You can call me at a toll free
2 number. You can write me a letter. This
3 is my address here. You can also call my
4 office phone number. This is the one
5 right here. Please don't send me any fax
6 comments or fax questions. We have a
7 little problem with our fax situation
8 right now.

9 But the best way to contact me to
10 voice opinions or ask questions is by
11 E-mail. That is the best way for me,
12 especially if you have a lot of comments
13 or want certain things really considered
14 in the EIS, give me the precise details
15 by way of E messages. As soon as I have
16 received the message, I will send you a
17 message back that I have it and your
18 comments can be easily manipulated by me
19 and I can send it to our contractor, PHE,
20 to incorporate this in our documents. So
21 if you have access to a computer, which
22 most of us have nowadays, the E-mail is
23 the preferred way of contacting me,
24 please.

25 Are there any questions on what I

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1 have said here? I tried to go through it
2 as quickly as I could.

3 If there are no questions then and
4 before we get to your comments, Sarah
5 Forbes from our office will give us her
6 presentation.

7 MS. FORBES: While we are getting
8 the computer set up, I will say good
9 evening and thank you for taking the time
10 to come to the meeting tonight. I know
11 going to a meeting is not always the best
12 thing to do in an evening and we
13 certainly appreciate the time you're
14 taking and any comments that you can
15 give.

16 What I'm going to do tonight, I'm
17 going to talk to you about the Carbon
18 Sequestration Program. First, I am going
19 to describe what is carbon
20 sequestration. I have been working on
21 carbon sequestration for five years now
22 and my mother is so proud, she just
23 learned how to say it.

24 So we are going to define it and we
25 are going to talk about fossil energy,

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1 why are we the ones funding the carbon
2 sequestration programs, talk about
3 greenhouse gases, a little bit about why

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4 we are interested in CO2 and not other
5 greenhouse gases.

6 And I will be getting into the
7 specifics of our program. I will be
8 giving you a very brief overview of our
9 program and also point you towards some
10 places you can look for more
11 information.

12 What is carbon sequestration?
13 Carbon sequestration, to sequester means
14 to put away. Carbon sequestration is the
15 capture and storage of CO2 or other
16 greenhouse gases that would otherwise be
17 emitted into the atmosphere.

18 In the media often times when you
19 hear carbon sequestration, they are often
20 referring to what we call terrestrial
21 sequestration or when CO2 is absorbed
22 from the air by plants and soils.

23 Sequestration can also occur when
24 CO2 is captured from a vent source, from
25 an emissions stack at a power plant, from

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1 an ethanol plant. There are a number of
2 different places but it's captured from
3 an emission source and then stored.

4 Storage locations include
5 underground reservoirs, quite possibly
6 the deep ocean and also converting CO2

7 into solid rock-like materials, as well
8 as incorporating the CO2 as part of
9 trees, plants and algae.

10 The United States and the world are
11 very reliant on fossil energy. In the
12 United States right now fossil energy
13 makes up 86 percent of our energy. We
14 have, as that slide shows, we have eight
15 percent nuclear, three percent hydro and
16 then three percent solar, wind,
17 geothermal and biomass.

18 Often times we tend to think of the
19 United States is still dependent on the
20 fossil energy because we are such a great
21 big country and reliant on the cars, but
22 when you look at the entire world, the
23 picture is very similar.

24 In the world right now, 86 percent
25 of our energy comes from fossil energy,

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1 six percent nuclear, slightly larger
2 hydro seven percent and, then again, a
3 small percent but growing in solar
4 energy, wind, geothermal and biomass.

5 Each year the Energy Information
6 Administration puts out predictions far
7 into the future. Right now we are
8 looking at 2025 and this is based on
9 their business as usual scenario but
10 today we use about 98 quads of energy and

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11 fossil fields provide 86 percent.

12 Their projections are that even
13 though at 2025 we'll be looking at a 40
14 percent increase in energy, 86 percent,
15 the percentage that will be covered by
16 fossil fields is still 86 percent or 87
17 percent. Pardon me.

18 Why C02? Scientists have noted and
19 the intergovernmental panel on climate
20 change has stated that there is a
21 discernible human influence on the
22 climate. And what that means is that
23 when you look at prior to the industrial
24 age and when you look at times now, there
25 is a drastic increase in the atmospheric

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1 concentrations of C02. Those atmospheric
2 concentrations of C02 have been closely
3 correlated with changes in temperature.

4 As you can see, the resemblance on
5 this draft is striking. Changes in the
6 atmosphere tend to correspond with
7 changes in temperature and the
8 temperature, as you most of you
9 recognize, is increasing.

10 Why C02? C02 is of interest sheerly
11 because of the volume. When you look at
12 greenhouse gases, 81 percent of
13 greenhouse gases is C02 from energy.

14 The other greenhouse gas that we
15 often worry about is methane and, as you
16 see, methane is only nine percent but
17 methane is the most potent greenhouse
18 gas. Most potent means that it has the
19 highest global warming potential.

20 So when methane gets into the
21 atmosphere, it causes climate change
22 quicker than the other greenhouse gases.
23 So CO2 is the greenhouse gas that we are
24 most concerned about but we are also
25 concerned about methane.

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1 All fossil fields and all energy
2 sources contribute to CO2 emissions. CO2
3 emissions are emitted when I turn on my
4 lights, when I leave the TV on when I am
5 home alone and I want to hear some noise,
6 and when I drive my car instead of riding
7 my bike to work.

8 CO2 is coming from all sectors.
9 It's not just residential use. It's not
10 just transportation. It's
11 transportation, residential, industry and
12 commercial.

13 And it's also divided among all
14 fossil fuels. Right now oil is up 46
15 percent, coal is 27 percent and natural
16 gas is 27 percent. You can't put the
17 blame on any one fuel or any one sector

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18 or any one source.

19 What can we do? We have three basic
20 categories of options for addressing the
21 greenhouse gas problem. They are all
22 important.

23 First, we need to reduce carbon
24 intensity. We need to use more renewable
25 fuels. We need to get that percentage of

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1 solar, wind, geothermal, hydro, we need
2 to get that percentage up.

3 Nuclear is another option. No
4 greenhouse gas problem. And also fuel
5 switching. If we switch to more natural
6 gas, less coal, it will impact the
7 greenhouse gas, it will decrease
8 greenhouse gas emissions.

9 We need to improve energy
10 efficiency. There have been some
11 analyses that have been done that showed
12 if we would switch to more energy
13 efficient lighting, the reduction of the
14 greenhouse gas emissions as a nation
15 would be reduced drastically. The way we
16 build buildings. There is a lot of
17 things we can do. But also efficiency in
18 our power plants. The average coal plant
19 right now is only maybe 70, 75 percent
20 efficient. We can do better than that.

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21 Those two things won't be enough.

22 Our third option is carbon

23 sequestration and that's what we are here

24 to talk about today, capturing and

25 storing CO2 and also enhancing natural

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27

1 sinks. By natural sinks, I mean

2 enhancing with the carbon that is stored

3 in the terrestrial systems, in plants,

4 soils and possibly the algae in the

5 ocean.

6 For the Carbon Sequestration Program

7 right now we have two primary

8 initiatives. I will start on the

9 right-hand side. On Valentines Day 2002,

10 President Bush announced the Global

11 Climate Change Initiative which calls for

12 an 18 percent reduction in greenhouse gas

13 intensity over the next 10 years.

14 Greenhouse gas intensity is an intensity

15 matrix that combines, it's a ratio of the

16 greenhouse gas emissions per million

17 dollars of GEP. The idea is that by

18 looking at the greenhouse gas intensity

19 matrix, we can sustain economic growth

20 and make reductions at the same time.

21 In the Global Climate Change

22 Initiative, President Bush also said in

23 2012 we are going to reevaluate, we are

24 going to look at what technology options

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25 we have available and make some decision

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1 on what we are going to do.

2 Carbon sequestration was also
3 discussed extensively in the National
4 Climate Change Technology Initiative
5 which was announced on June 11th, 2001.

6 I would like to read the quote that
7 President Bush gave because I think it's
8 worth reading: "We all believe
9 technology offers great promise to
10 significantly reduce emissions,
11 especially carbon capture, storage and
12 sequestration technology."

13 Okay. I will go through one of the
14 basics. One of the next questions people
15 ask is, well, how much room is there and
16 how much CO2 can we store? The answer is
17 we are doing the research program because
18 we are not exactly sure.

19 On this chart I think you can see
20 there is bold and then there is shaded.
21 The bold is the estimate that we are
22 fairly certain about and the shaded is
23 that potential that we are really not
24 sure about.

25 You can see that the potential, for

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1 example, in deep saline formation is huge
2 but what we know is the storage is not
3 quite as big there.

4 There are some saline formations
5 that are estimated to be able to store
6 hundreds of years worth of CO2 emissions
7 but there is a lot of things we don't
8 know about those CO2 emissions and that
9 is why we are doing research and field
10 testing really to characterize those
11 reservoirs.

12 Even with terrestrials, there is a
13 good deal of certainty. We know a lot
14 about ecosystems; we know a lot about
15 carbon cycles; we know how carbon is
16 stored, but there is also a degree of
17 uncertainty in that area that we don't
18 know.

19 But even when you take the bold
20 bars, the potential is very huge and it
21 looks promising. In fact, we have done
22 an analysis that looks at stabilizing
23 greenhouse gases, stabilizing CO2
24 emissions at 2001 and it would take us
25 out to 2050.

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1 This is one plausible scenario for
2 how you might meet that goal. You can

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3 stabilize CO2 emissions at 2001 levels
4 but you're going to need a number of
5 different approaches.

6 In this scenario about a third of
7 the reductions could come from energy
8 efficiency and renewables. You can get
9 some more through forestation and
10 agricultural and terrestrial
11 sequestration tanks and looking at those
12 non CO2 GH gases, primarily methane, as I
13 mentioned earlier. Sequestration is
14 going to play a big role if we are really
15 serious about stabilizing CO2 emissions.

16 You can't move forward with
17 sequestration unless it has certain
18 requirements. First of all, it needs to
19 be environmentally acceptable. You can't
20 leave a legacy for future generations. A
21 climate change problem is a problem we
22 are addressing because we don't want
23 future generations to have some of the
24 serious impact we believe might happen
25 but we can't come up with a technology

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1 solution that leaves a legacy we don't
2 have to deal with.

3 We need to respect existing
4 ecosystems. We need to make sure that
5 sequestration is safe. We can't have any

6 sudden large scale leaks of CO₂. We need
7 to have plans in place to monitor the
8 situation and to mitigate any leaks
9 before they happen. We have to ensure
10 that it is safe, environmentally
11 acceptable and verifiable.

12 If we are doing this for an
13 emissions reduction purpose, we have to
14 be able to verify that we are storing CO₂
15 and that it's staying there. It needs to
16 be economically viable because, as we all
17 know, it's not going to happen if it's
18 not affordable.

19 Within the Department of Energy
20 there are three main agencies, three main
21 offices, I should say, that are looking
22 at sequestration. The Climate Change
23 Technology Program does the overall
24 coordination. The Office of Science does
25 basic research. A good example of that,

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1 the Office Of Science would be looking at
2 microbes and looking at the mechanism of
3 how microbes in the soil store carbon.

4 Now, the Office of Fossil Energy, we
5 are the applied R&D folks. We may say
6 the Office Of Science has identified that
7 microbe and that process and now we are
8 going to look at how we can multi, get
9 more microbes in the soil and how you can

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10 enhance that in a practical real
11 setting.

12 The Department of Energy is not the
13 only agency at the federal level looking
14 at sequestration. We coordinate with a
15 number of federal agencies. We work with
16 the U. S. Department of Agriculture on
17 terrestrial sequestration. The U. S.
18 Geological Service is very involved in
19 our geological sequestration options.

20 We are beginning to work more
21 closely with EPA on identifying some of
22 the regulatory barriers on how
23 sequestration may be regulated some day.
24 The U. S. Department of State facilitates
25 our international collaborative

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1 activities and the list goes on.

2 At the top is our basic program
3 structure for the carbon sequestration
4 program structure. First I'm going to
5 talk about this circle on your far left.
6 This is our core R&D. We have a number
7 of research and development projects.
8 Looking at, first of all, the capture of
9 CO2, that's capturing CO2 from power
10 plants or other vent sources. Good
11 examples of other vent sources would be
12 ethanol plants or natural gas

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13 reprocessing plants.

14 Second, we have research going on in
15 sequestration that includes direct, both
16 direct injection of CO2 that has already
17 been captured from one of your vent
18 sources or by enhancing our natural sinks
19 through terrestrial sequestration.

20 We have an area of the program
21 called breakthrough concepts. That is an
22 area of the program where we get those
23 truly revolutionary ideas that offer the
24 potential for the improvements. An
25 example I like to give is that is where

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1 we get the ideas of turning CO2 into a
2 useful product, something we can all
3 use.

4 We have a few projects looking at
5 methane, capturing methane from land
6 fills, capturing methane from coal mines
7 and using it.

8 And finally we have an area of the
9 program for monitoring, mitigation and
10 verification. That is monitoring any
11 injection of CO2 or monitoring CO2 that
12 is stored in terrestrial systems to make
13 sure that CO2 is still in storage.

14 In a terrestrial system, you may
15 have a tree plantation that turns into a
16 forest fire so monitoring is an essential

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17 part, through all phases of the project
18 wherever the project begins, during
19 injection and planting and also after
20 over long term.

21 Mitigation, that's having a plan,
22 having technologies available that if it
23 looks like there is going to be a leak in
24 the system, going in and fixing it before
25 it happens, being ready.

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1 And verification, over the long term
2 for emissions accounting purposes, we
3 need to have careful accounting and
4 verification of CO₂, being able to prove
5 that, yes, it is in storage.

6 The second part of the program that
7 I will be talking a little bit more about
8 is the infrastructure piece. If there
9 were legislation to come through tomorrow
10 that nationwide we needed to reduce CO₂
11 emissions drastically, we may not have
12 the infrastructure in place for carbon
13 sequestration to happen and that's what
14 the regional partnerships are designed to
15 do.

16 We have seven regional
17 partnerships. I'll talk more about them
18 in a minute. What the partnerships are
19 doing right now is they are evaluating

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20 regional sequestration options and
21 looking at what makes sense, what role
22 can carbon sequestration play in each
23 region of the country.
24 The two other circles on this chart,
25 the one on the bottom is for FutureGen.

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1 I will be talking a little bit more about
2 that but FutureGen is an initiative to do
3 a demonstration of sequestration at a
4 power plant at a significant scale, not a
5 500 megawatt power plant but maybe a 150
6 megawatt power plant and geological
7 sequestration combined with that, and I
8 will talk just a little bit more about
9 that in a few minutes.

10 The fourth circle that is up there
11 on the left, that's the Carbon
12 Sequestration Leadership Forum. That is
13 the international forum for collaboration
14 that has been established by regional
15 headquarters and there are 13 countries
16 that are signatories right now. And they
17 are really looking at international
18 collaboration on carbon sequestration
19 research.

20 The regional partnerships, this
21 graph shows all seven regional
22 partnerships. As I mentioned, we have
23 seven right now. They include 154

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24 organizations, two Canadian provinces,
25 three Indian reservations and 40 states.

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1 You are probably familiar with the
2 Great Plains Regional Partnership right
3 here. We have the West Coast
4 partnership, the Big Sky partnership
5 which includes a few states, the
6 Southwest Regional Partnership, the
7 Illinois Basin and Southwest and
8 Midwest.

9 The graph is a little confusing
10 because there is a lot of shaded space.
11 The shading indicates that it's being
12 shared among two partnerships.

13 As is mentioned, the regional
14 partnerships are baseline region for
15 sources and sinks. They are doing
16 something that I think is really
17 exciting. They are looking at assessing
18 regulatory, environmental, outreach
19 issues. I'm involved from the outreach
20 standpoint and it's really fantastic. We
21 are beginning to deal and talk about some
22 issues that nobody has thought about
23 before and it's really getting out there
24 and having meetings like this and finding
25 out what people think about the idea.

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1 They are establishing monitoring
2 verification protocols.

3 There is a phase II and pending
4 current funding, of course, we will be
5 doing some small scale validation
6 testing. In the phase I, the
7 partnerships are identifying what
8 sequestration options make more sense.
9 The next phase is testing on a small
10 scale and determining the benefits to the
11 region.

12 I would like to say a few more words
13 about FutureGen. As I mentioned,
14 FutureGen will be a demonstration of a
15 power plant's scale, both production of
16 power and sequestration, but also
17 production of hydrogen for transportation
18 fields. It's great. It ties into three
19 presidential initiatives: Freedom Car,
20 which is providing the hydrogen
21 transportation fields, the Clear Skies
22 initiative, which calls for the reduction
23 of air pollution including mercury and
24 climate changes.

25 The guy who sits next to me is on

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1 the FutureGen team and it's really fun.

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2 They come up with some great questions as
3 they are beginning to scope out what it
4 takes and especially with regard to
5 sequestration because most of it is new.

6 I should mention FutureGen is not
7 technically a part of the sequestration
8 program but we use it because
9 sequestration is so critical to the
10 FutureGen effort.

11 As Heino mentioned, we have a web
12 site with a lot of information. I would
13 like to encourage you to visit that web
14 site and particularly -- anything you
15 want to know about sequestration and
16 probably a lot more is on this web site.

17 I would particularly like to point
18 you to the reference shelf. We post
19 presentations and there is a ton of
20 information there. Also there is a list
21 of contacts. If you're interested in
22 particular aspects of sequestration, you
23 can probably find a contact there that
24 will point you to the right person.

25 And finally each month we send out

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1 an E-mail news letter. I encourage you
2 to get on line and sign up to receive the
3 news letter. It includes sequestration
4 when it appears in the news and as well

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5 as any journal articles and any program
6 type announcements that we may have.
7 That is the end of my presentation.
8 I will be happy to take any questions.
9 Okay. Well, thank you very much.
10 Do you want me to introduce you, Ed?
11 MR. STEADMAN: I don't care.
12 MR. GRIESHABER: Heino, why you
13 don't you ask if there are any members of
14 the public that wish to speak?
15 MR. BECKERT: For the record, are
16 there any members of the attending public
17 who want to make a comment or want to
18 speak?
19 MR. STEADMAN: Yes, I would like
20 to.
21 MR. BECKERT: Would you please come
22 up here and, for the record, state your
23 name and your affiliation, please. Thank
24 you.
25 MR. STEADMAN: My name is Ed

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1 Steadman. I'm a Senior Research Advisor
2 at the Energy & Environmental Research
3 Center at the University of North
4 Dakota.
5 I'm also the project manager for the
6 Plains Carbon Dioxide Reduction
7 Partnership, which is one of the seven
8 DOE regional partnerships.

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9 I would like to give you a short
10 presentation this evening discussing,
11 first of all, just give a brief
12 introduction for those of you who might
13 not be totally familiar with the ERC, I
14 will make that very brief, and then also
15 a very brief overview of the activities
16 of the Plains Carbon Dioxide Reduction
17 Partnership, which I will probably refer
18 to as the PCOR Partnership, since that is
19 how we refer to it specifically at the
20 ERC.

21 About the ERC, I guess most people
22 here are familiar with the ERC but I
23 would like to say a couple of things and
24 that is that we do a lot of different
25 work at the Energy & Environmental

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1 Research Center.
2 As the name implies, a lot of work
3 with energy related topics, mostly energy
4 work that we do is related to the
5 environmental aspects of energy, either
6 production, processing or handling, air
7 pollution, water pollution and things
8 like that related to energy processing
9 and production.
10 Also we do a lot of environmental
11 work related to water and soils and much

12 that is related to energy but not all of
13 it.

14 One of the things I want to point
15 out here is the ERC is a very
16 multi-disciplinary place. We receive no
17 funding from the State of North Dakota so
18 at any given time we have a lot of
19 different research projects happening and
20 we work with a lot of different federal
21 agencies and we do a lot of work with
22 industry.

23 About 70 percent of our projects
24 have at least some industrial funding and
25 this multi-disciplinary approach, a

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1 multi-agency approach, I think is a very
2 useful thing, and it will be very useful
3 with the PCOR Partnership and it has been
4 and will be in the future.

5 Our philosophy -- I won't read this
6 verbatim or anything but our philosophy,
7 again, is multi-disciplinary, very very
8 focused on getting results, very focused
9 on the client needs, and doing whatever
10 it takes to get the best product to our
11 clients.

12 Although we are part of a
13 university, as I say, we receive no state
14 funding and this gives us a very
15 practical and more of a business approach

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16 than perhaps some other university groups
17 would have.

18 Okay. About the PCOR Partnership
19 now. The PCOR Partnership is unique in
20 several regards. One is that we also
21 have two Canadian provinces and we are
22 beginning to discuss including an
23 additional province, the Province of
24 Alberta, because they have a lot of
25 activity in that region, and also the

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1 nine states and basically in the upper
2 Midwest or Great Plains States and, once
3 again, seven regional partnerships.

4 And we also are unique or I guess we
5 are lucky in that we have the Great
6 Plains gasification plant that is
7 supplying CO2 right now commercially to
8 the Weyburn field in Saskatchewan for oil
9 recovery. So this is a very important
10 project and it's an important part of the
11 PCOR region.

12 One of the other things that I think
13 we are proudest of with the PCOR
14 Partnership is the number of participants
15 that we have from industry. Again, this
16 is a focus and the strength of the ERC in
17 many many programs and we feel that the
18 industrial participation not only

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19 provides additional resource in terms of
20 matching funds and in terms of often data
21 and things like that, but it also ensures
22 that what we are doing is very very
23 practical and not just kind of, more of
24 an academic study but what we are doing
25 is being voted for with the dollars by

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1 industry and that we are not just doing
2 esoteric research. We are doing things
3 that are very practical and will be
4 applied.

5 We have, as you can see, many many
6 commercial sponsors and many of these are
7 utilities, also oil and gas companies,
8 and many many other groups.

9 Geological sequestration. Another
10 advantage I think we have in the PCOR
11 region is that we have some very very
12 great areas, great sedimentary geologic
13 basins that can be potentially used for
14 sequestration.

15 The Williston Basin, in particular,
16 which is this portion of the PCOR region,
17 is not only a very deep sedimentary basin
18 with proven coal and oil and gas reserves
19 but it is also very tectonically stable
20 and we feel that there are a great deal,
21 there may be a great number of
22 opportunities here for practical

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23 sequestration methods.

24 In phase I here of the PCOR

25 Partnership we are looking at a fairly

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1 detailed characterization of all of the
2 sources and sinks in the entire region.
3 And we also are blessed with a lot of
4 potential for terrestrial sequestration.
5 It's a highly agricultural region so
6 things like alternate agricultural
7 practices are quite possible in our
8 region.

9 And also there is a lot of wetlands
10 in our region. We have a program at the
11 USGS and Ducks Unlimited Canada and a few
12 others to look at using wetlands for
13 carbon sequestration. And in some
14 portions of the region we also even have
15 forests and other sources for various
16 terrestrial sequestration.

17 We have talked about sinks, you
18 know, both terrestrial and geologic
19 sinks. We also have, of course, a number
20 of sources in the region.

21 You can see that in the -- sorry.
22 There is, often there is concentrations
23 of some of the sources. And we also have
24 infrastructure, we have pipelines and
25 things in place.

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1 And so our goal with the partnership
2 right now and what we have been doing in
3 this first year of our activity is to do
4 a detailed characterization of the
5 existing sources, existing potential
6 sinks, the infrastructure that
7 potentially can tie them together or even
8 presently does tie them together, and
9 then look at things like the deployment
10 issues which would be monitoring and
11 verification and environmental issues.

12 We have an outreach program, which
13 is what we are doing here this evening.
14 And so the idea is to match the sources
15 with sinks and develop practical
16 scenarios for sequestration in the
17 future.

18 And we are going to do detailed
19 economics. This flow chart kind of pulls
20 it all together in that we are going to,
21 through the characterization of the
22 existing sinks and sources, we are going
23 to develop screens, based on physical
24 properties, that will allow us to
25 eliminate some of the sources and sinks

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1 just based on things like volume and
2 things like that.

3 Then we are going to look at the
4 juxtaposition of the sources and sinks
5 and any infrastructure issues that are
6 involved with it. And then that is when
7 we are going to get into deployment. So
8 we are basically going to have a series
9 of screens that will eliminate sink
10 source pairs that don't make sense either
11 from an environmental point of view or
12 from an economic point of view or any
13 other sort of practical consideration.

14 Then once we dwindle those potential
15 sequestration options down, we will apply
16 detailed economics to the remaining sink
17 source scenarios. And once we have done
18 that, that will also discriminate between
19 what would be I guess the lowest hanging
20 fruit or the most practical sequestration
21 options available right now.

22 And then we'll also be looking at
23 technological or environmental or any
24 other infrastructure barriers to what
25 could be sequestration options and, you

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1 know, that information will be used to
2 develop a series of scenarios that could
3 be proposed for phase II activities, for

4 demonstration of either actual
5 sequestration or looking at some of the
6 technological issues that may be impeding
7 what could otherwise be viable
8 sequestration options.

9 So that is just a very very brief
10 overview of the PCOR. I would be happy
11 to answer any questions anyone has here
12 this evening.

13 There is my contact information and
14 my phone number, E-mail and so forth, and
15 I would be happy to discuss PCOR or any
16 other activities at any time.

17 Thanks.

18 MR. BECKERT: I have a question.
19 Can we get a copy, an electronic copy of
20 your presentation?

21 MR. STEADMAN: Yes. Joe already has
22 one.

23 MR. BECKERT: Thank you very much.
24 The information has been very valuable to
25 us.

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1 MR. STEADMAN: Any other questions
2 or comments? Thanks.

3 MR. BECKERT: Thank you very much
4 for your presentation.

5 Are there any other persons here who
6 would like to make a statement or comment
7 tonight?

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8 If there are no other folks here
9 desiring to make a comment, I would like
10 to remind you of the fact that the
11 closing date for comments on this
12 programmatic EIS is June the 25th.

13 Any comments that we receive by this
14 time, by this date, we will certainly
15 accommodate and deal with in the draft
16 document. Comments received after the
17 25th we will use if we possibly can.

18 So we thank you for your taking the
19 time in coming out here. I wish you all
20 a safe travel home and I thank you again
21 for your participation tonight.

22 At seven minutes until eight on the
23 10th of June, I declare this meeting
24 adjourned. Thank you very much.

25 (Whereupon, the hearing was

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1 concluded at 7:50 o'clock p.m.)
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1 C E R T I F I C A T E

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3 STATE OF NORTH DAKOTA

4

5 COUNTY OF GRAND FORKS

6

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8 I, JOYCE A. HALVERSON, Court
9 Reporter, certify that I was authorized
10 to and did stenographically report the
11 foregoing proceedings and that the
12 transcript is a true record.

13

14 Dated this 14th day of June, 2004.

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JOYCE A. HALVERSON

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Court Reporter

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